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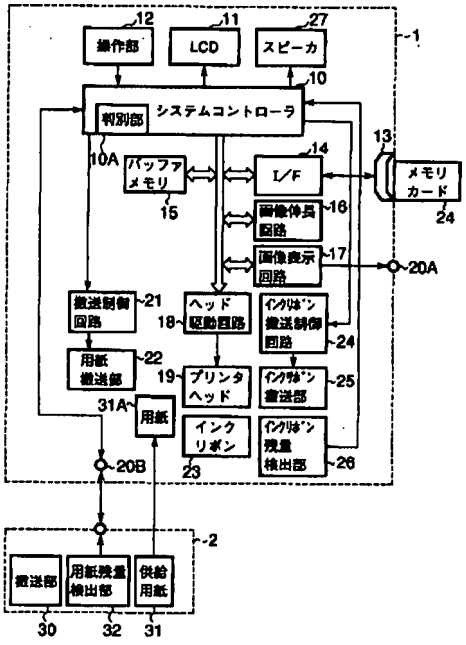
(54)【発明の名称】　プリンタ

(57)【要約】
【課題】特に複数枚の用紙に画像を印刷するときに、印刷終了時間及び消耗品の消耗状態を事前に確認できるようにして、操作性の優れた便利なプリンタを提供することにある。
【解決手段】印刷動作の前に、印刷所要時間及び消耗品の消耗状態を表示する機能を備えたプリンタが開示されている。同プリンタのシステムコントローラ１０は、予約処理時に指定された印刷枚数分の画像を印刷するときの印刷所要時間を算出して表示する。更に、システムコントローラ１０は、用紙及びインクリボンの残量を検出して、指定された印刷仕様の印刷動作が可能であるか否かを判定し、印刷不可能であれば警告表示を実行する。



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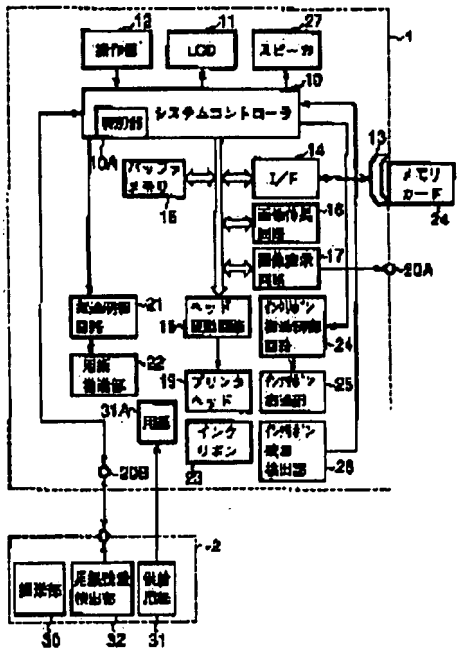
(54) PRINTER

(57)Abstract:

PROBLEM TO BE SOLVED: To know the print end time previously by calculating the number of print copies and the time to be elapsed before ending print operation depending on the image size of a print object and then displaying them on a screen.

SOLUTION: Image (print frame) of a print object is selected on an index image screen by operating image select keys at an operating section 12. A reserve/number of sheet key is then operated and a system controller 10 executes a specified print reservation processing. More specifically, setting of print specification and the content of setting designated by a user are displayed on a screen. A time required for printing a selected image is calculated based the set print specification and print data generating time and presented in a specified region on the display. When a print execution key is operated after reservation processing, the system controller 10 executes print processing in units of sheet. Remaining print time is calculated by subtracting actual print processing time from the required printing time calculated at the time of reservation processing and presented in a specified region on the display.



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1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

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FULL CONTENTS

[Claim(s)]

[Claim 1] A picture specification means to generate the print data corresponding to image data, to be the printer which prints a picture and to specify the picture of a printing object based on said image data on a form, A number-of-sheets specification means specified by said picture specification means to specify the printing number of sheets of a form for every picture, The printer characterized by providing a calculation means to compute the printing office important point time when printing the picture specified by said picture specification means by the printing number of sheets specified by said number-of-sheets specification means, and a display means to display said printing office important point time or the time related to the print operation concerned.

[Claim 2] Said display means is a printer according to claim 1 characterized by displaying the residual time of the printing office important point to the end of printing concerned based on the printing office important point time computed by said calculation means during the schedule time of the end of printing when printing said specified picture by said printing number of sheets, or printing execution.

[Claim 3] Said calculation means is a printer according to claim 1 characterized by computing said printing office important point time by using as an element creation time of said print data computed based on the file size and printing image size of image data of said picture in addition to said printing number of sheets.

[Claim 4] A number-of-sheets specification means to generate the print data corresponding to image data, to be the printer which prints a picture and to specify the printing number of sheets of a form on a form using an ink ribbon, A form residue detection means to detect the remaining number of sheets of the form which can be printed, and an ink ribbon residue detection means to detect the residue which can print said ink ribbon, A judgment means to convert into the printing number of sheets specified by said number-of-sheets specification

means, and to judge whether said form residue and said ink ribbon residue are under necessary minimum, The printer characterized by providing the warning means of which either said form residue or said ink ribbon residue warns to said printing number of sheets in being insufficient based on the judged result of said judgment means.

[Claim 5] A calculation means to compute the printing office important point time per sheet of the form corresponding to the picture of a printing object, A warning time calculation means to compute time until either said form residue or said ink ribbon residue is exhausted based on the printing office important point time by said calculation means to the grade which cannot perform the printing job for said printing number of sheets, The printer according to claim 4 characterized by having further a display means to display the time computed by said warning time calculation means.

[Claim 6] A calculation means to compute the printing office important point time per sheet of the form corresponding to the picture of a printing object, A warning time calculation means to compute time until either said form residue or said ink ribbon residue is exhausted based on the printing office important point time by said calculation means to the grade which cannot perform the printing job for said printing number of sheets, The printer according to claim 4 characterized by having further a display means to display the time computed by said warning time calculation means.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the printer for printing on a form the picture obtained by having taken a photograph, for example with the digital camera.

[0002]

[Description of the Prior Art] It is easy to change the photoed picture into digital image data, and to record on record media, such as a memory card, by development of image recording equipment, such as a digital camera (electronic "still" camera), in recent years.

[0003] By the way, it not only saves a picture, but as the usage of image data recorded on the memory card, there are soft copy displayed on display screens, such as a television receiver, and hard copy printed on a form by a printer again.

[0004] Unlike soft copy, in the hard copy by a printer, a setup of the printing specification which specifies print sheet number of sheets, printing size (image sizes, such as expansion/reduction, are included in addition to a paper size), etc. is needed. Moreover, it is necessary to manage what is called articles of consumption, such as a form and an ink ribbon, by a printer.

[0005]
[Problem to be solved by the invention] By specifying print sheet number of sheets, printing size, etc., the same picture is printed on two or more sheets of forms, or printing size is changed, and the printer (full color printer) which prints the picture photoed with the digital camera etc. can be printed. here -- especially -- a full color printer -- printing time (until it outputs the printed form) -- for example, per sheet -- a number -- about 10 seconds is required. Moreover, time to exceed about 1 minute depending on the size of printing size (a paper size or image size) is required. For this reason, since the user in particular cannot check the time to the end of printing when performing printing of two or more sheets at once, checking after suitable time progress is common. Therefore, it is very inconvenient for the useless latency time to occur to a user, or to forget, separated from a printer etc.
[0006] Furthermore, by a printer, as mentioned above, since a form and an ink ribbon are articles of consumption, a form or an ink ribbon may be lost during the print operation of two or more sheets. In such a case, a user supplies a form or an ink ribbon and operation of making print operation resuming is needed. Since the user cannot check a form and the state [exhausting] of an ink ribbon, he does not supply the article of consumption concerned to a printer in advance. For this reason, if a form or an ink ribbon is especially lost during the print operation of two or more sheets, a printing stop state will continue until a user checks. Therefore, there is an inconvenient field, such as making time useless.
[0007] Then, there is especially the purpose of this invention in offering the useful printer which was excellent in operability, as printing end time can be checked in advance, when printing a picture on two or more sheets of forms.
[0008] Furthermore, the purpose of this invention is to offer the printer which can prevent beforehand generating of a stop state of the print operation by an article of consumption, as states [exhausting], such as a form and an ink ribbon, can be checked.
[0009]
[Means for solving problem] The 1st viewpoint of this invention is a printer which has a number-of-sheets specification means to specify the printing number of sheets of the form which prints a picture, a calculation means to compute the printing office important point time when printing the picture for the printing number of sheets concerned, and a display means to display the printing office important point time concerned. The number-of-sheets specification means can specify printing number of sheets for every picture specified by the picture specification means.
[0010] Furthermore, specifically, a calculation means computes the time required to the end of printing according to the image size (size of an image data file) of the printing object with printing number of sheets. A display means displays printing office important point time or printing finish time computed, for example on screens, such as TV monitor, in the video signal

output from a printer.

[0011] If it is the printer of such composition, the user can check the time of the end of printing by the printing office important point time or printing finish time displayed on the display screen, when printing especially continuously the picture photoed, for example with the digital camera by required number of sheets. Therefore, a user can prevent beforehand the situation which the useless latency time -- other work can be done to printing end time -- generates, after starting the print operation of a printer.

[0012] The 2nd viewpoint of this invention is the printer which detected the residue of the article of consumption of a form or a printer like an ink ribbon, and was equipped with the function in which a user can check whether the necessary minimum article of consumption is secured, in the print operation in the appointed printing number of sheets. A form residue detection means to specifically detect the remaining number of sheets of the form which can be printed, An ink ribbon residue detection means to detect the residue which can print an ink ribbon, It converts into the specified printing number of sheets, and to printing number of sheets, a judgment means to judge whether a form residue and an ink ribbon residue are under necessary minimum, or a form residue or an ink ribbon residue has a warning means to warn, in being insufficient.

[0013] If it is the printer of such composition, the user can check whether a form and the article of consumption of an ink ribbon are insufficient when [concerned] carrying out printing completion on the display screen, when printing especially continuously the picture photoed, for example with the digital camera by required number of sheets. Therefore, before starting print operation, the user can make print operation start, after supplying a required article of consumption if it runs short. Thereby, print operation stops from shortage of an article of consumption, and it becomes possible to prevent beforehand the situation which is neglected with the stop state.

[0014]

[Mode for carrying out the invention] With reference to Drawings, the form of operation of this invention is explained below.

[0015] Drawing 1 is the block diagram showing the important section of the printer related to this embodiment.

[0016] (Composition of a printer) As shown in drawing 1 , the printer of this embodiment is divided roughly, for example, consists of sublimated type the printer bodies 1 and the form feeders 2. The printer body 1 has a system controller 10, the liquid crystal display (LCD) 11, a control unit 12, the card slot 13 of a memory card 24, an interface 14, buffer memory 15, the picture expansion circuit 16, and the image display circuit 17.

[0017] A system controller 10 is a system control station, and it has the distinction section (distinction function by a firmware) 10A for performing calculation processing of printing office

important point time, a form, and residue decision processing of an ink ribbon so that it may mention later with control of each component. A system controller 10 builds a firmware (control program) into a microprocessor (CPU), and is constituted. LCD11 are a display for performing the status display according to various kinds of control processings outputted from a system controller 10. A control unit 12 consists of a key button etc., and inputs into a system controller 10 the signals (specification of printing specifications, such as printing number of sheets mentioned later, etc.) according to operation of a user.

[0018] A card slot 13 holds a memory card 24 removable, and connects a memory card 24 and an interface 14 concerned. An interface 14 is electrically connected, in order to input the image data recorded mainly on the memory card 24 in the printer body 1. Buffer memory 15 stores the image data (for example, image data compressed by the JPEG method) inputted from the memory card 24. The picture expansion circuit 16 elongates the picture compression data stored in buffer memory 15, and stores it in a built-in image memory. The image display circuit 17 carries out display processing of the image data by which extension processing was carried out in the picture expansion circuit 16, and outputs it to the output terminal 20A. Image display equipment, such as a television set, is connected to the output terminal 20A, for example (see drawing 2). The image display circuit 17 outputs picture selection screen data required not only for the image data from a memory card 24 but printing controlling from a system controller 10 etc. through the output terminal 20A (see drawing 3).

[0019] Furthermore, the printer body 1 has the head drive circuit 18, a printer head 19, the mechanism section that conveys a form, and the mechanism section which drives an ink ribbon. The mechanism section of form conveyance consists of the form conveyance section 22 and the conveyance control circuit 21 for feeding paper to the form 31A supplied from the form feeder 2. The mechanism section of an ink ribbon drive consists of the ink ribbon conveyance section 25 and the ink ribbon conveyance control circuit 24 for conveying the ink ribbon of a ribbon cartridge (delivery). The head drive circuit 18 drives a printer head 19 by control of a system controller 10 according to the print data (print data) corresponding to image data (image data by which extension processing was carried out in the picture expansion circuit 16). A printer head 19 color-prints the picture specified as the form 31A supplied from the form feeder 2.

[0020] Furthermore, it has the ink ribbon residue detecting element 26 for detecting the residue of an ink ribbon so that the printer body 1 of this embodiment may be mentioned later (see drawing 6). Moreover, it has a loudspeaker 27 as an output unit which constitutes a user interface with LCD11 and a control unit 12. A system controller 10 may perform a warning process by the voice output which uses a loudspeaker 27 with LCD11, when performing a warning process so that it may mention later.

[0021] On the other hand, the form feeder 2 has the conveyance section 30 for driving supply

of the form stowage and form which store two or more sheets of forms 31. Here, as shown in drawing 2 , to the printer body 1, the form feeder 2 is removable, for example, consists of cartridge structure which stores about 30 sheets of print sheets 31. Furthermore, the form feeder 2 of this embodiment has the form residue detecting element 32 for detecting the residue of the form 31 stored by the cartridge (see drawing 7). The form residue detecting element 32 sends out a residue detection signal to a system controller 10 through the input/output terminal 20B of a printer body.

[0022] (Print operation) Below with drawing 1 , the print operation of this embodiment is explained with reference to the flow chart of drawing 2 , drawing 3 , drawing 4 , and drawing 8 .

[0023] First, the printer body 1 of this embodiment is connected to the TV (Television Sub-Division) receiver 40 by the video cable 41 as shown in drawing 2 . That is, as mentioned above, it connects with the TV (Television Sub-Division) receiver 40 through the output terminal 20A for videos, and a video cable 41, and the printer body 1 displays the index image for the picture selection mentioned later, and the picture data related to print operation on the display 42 of the receiver 40 concerned.

[0024] Moreover, the key 12D for setting up the reservation / number-of-sheets key 12C for setting up printing Enter key (printing start key) 12A, the picture selection key 12B, and printing reservation / number of sheets, and a print direction etc. is formed in the control unit 12 of the printer body 1.

[0025] Here, it is divided roughly into the actual printing job according to operation of printing Enter key 12A, and the reservation processing according to operation of reservation / number-of-sheets key 12C as print operation of this embodiment. First, the procedure of reservation processing is explained mainly with reference to the flow chart of drawing 3 and drawing 8 .

[0026] If a user sets a memory card 24 to the card slot 13 of the printer body 1, a system controller 10 will detect that and will perform various kinds of initial motion in advance of print operation (YES of Step S1). A system controller 10 displays an index image screen on the display 42 of the television receiver 40 through the image display circuit 17 and the output terminal 20A, as shown in drawing 3 (Step S2). This index image is the picture 43 which reduced the image data of two or more coma (two or more sheets) currently recorded on the memory card 24. The user can check the image shot (for example, picture photoed by the digital camera) currently recorded on the memory card 24 by the display screen of an index image.

[0027] A user's operation of the picture selection key 12B of a control unit 12 will perform processing which chooses the picture (printing coma) of a printing object from an index image screen (YES of Step S8, S9). A system controller 10 indicates by selection the selection coma (namely, picture specified as a printing object) by which selected designation was carried out

with cursor 44 etc., as shown in drawing 3 (Step S10). Here, if a memory card 24 is discharged from a card slot 13, future processings will be suspended until a memory card 24 is set (YES of Step S11).

[0028] Next, if reservation / number-of-sheets key 12C is operated after the picture of a printing object is chosen, a system controller 10 will perform predetermined printing reservation processing (YES of Step S12). That is, a setup and its contents of a setting of the printing specification by the specification from a user are displayed on Screen 42 (Step S13). Printing specification means the printing number of sheets of the selected picture, and printing size (a paper size and image size). Such printing specifications are set up by operation of reservation / number-of-sheets key 12C.

[0029] Here, in this embodiment, a system controller 10 computes the printing office important point time of the selected picture based on the creation time of printing specifications, such as set-up printing number of sheets, and print data, and displays it on the predetermined region 42A on a display 42 (Step S14). As specifically shown in drawing 3 , when the printing number of sheets of the selected picture 43 is set to "5", [a system controller 10] The printing office important point time (for example, 12 minutes) to the end of printing for the reserved printing number of sheets from the printing job time per [which is set up beforehand] sheet (it changes with a paper size and image sizes) is computed. In addition, display processing of the printing office important point time concerned is later mentioned with reference to the flow chart of drawing 9 .

[0030] If printing Enter key 12A is operated after the above reservation processings (the selection process of a picture is included), a system controller 10 will perform the printing job of an one-sheet unit (YES of Step S3, S5). At the time of printing execution, a system controller 10 displays "under printing execution" on a display 42, as shown in drawing 4 . Furthermore, in this embodiment, a system controller 10 computes the residual time to the end of printing which subtracted actual printing job time from the printing office important point time computed at the time of the above-mentioned reservation processing, and displays it on the predetermined region 42A on a display 42 (Step S4). When print operation is stopped by shortage of articles of consumption, such as a form or an ink ribbon, at this time so that a system controller 10 may be mentioned later, an alarm display is carried out to another predetermined region 42B on a display 42 (see drawing 5).

[0031] A system controller 10 confirms whether the printing job ended only the set-up printing number of sheets (P= 5), after the printing job in every sheet is completed (Step S6, S7). When the printing job is not completed, processing from Step S4 to S7 is repeated. On the other hand, after the printing job of the set-up printing number of sheets (P= 5) is completed, a system controller 10 repeats the processing from Step S1 until the memory cart 24 is discharged from a card slot 13.

[0032] (Display processing and the warning process of printing office important point time) With reference to drawing 7 and the flow chart of drawing 9 , display processing and the warning process of printing office important point time in the print operation of this embodiment are mainly explained from drawing 4 below.
[0033] A system controller 10 computes printing office important point time at the time of reservation processing, as mentioned above (Step S20). Furthermore, as shown in drawing 1 , based on the detection signal from the ink ribbon residue detecting element 26 of the printer body 1, a system controller 10 converts an ink ribbon residue at present into printing number of sheets (RR), and detects it (Step S21). Similarly, a system controller 10 detects a form residue (the number PR of forms) at present based on the detection signal from the form residue detecting element 32 of the form feeder 2, as shown in drawing 1 .
[0034] Here [the ink ribbon residue detecting element 26 of this embodiment] As shown in drawing 6 (A), beforehand, the ink ribbon 23 which printed the bar code 60 which shows the numeric value of the number of sheets concerned to the operating position corresponding to printing number of sheets is used, and, specifically, an ink ribbon residue is detected by reading the bar code 60 concerned. By an example, if the bar code 60 as shown in this figure (B) is read, the printing number of sheets (remaining here 21 sheets) which can be printed is detectable using an ink ribbon 23.
[0035] On the other hand, the detection signal (voltage value) from the amount detector 72 of forms established in the conveyance section 30 of the form feeder 2 is changed into the digital value corresponding to the amount of forms, and the form residue detecting element 32 sends it out to a system controller 10, as shown in drawing 7 . With the pickup roller 70 of the conveyance section 30, the amount detector 72 of forms changes change of a form residue into a voltage value, whenever the form 31 of an one-sheet unit is conveyed by the printer body 1, and it outputs it to the form residue detecting element 32.
[0036] By above ink ribbon residue detection systems and form residue detection, a system controller 10 compares both, if an ink ribbon residue (number-of-sheets conversion RR) and a form residue (PR) are detected (Step S22). That is, it converts into printing number of sheets, and a way with few [relatively] (in being the same, let RR be predominance) residues is set up as number of sheets (PA) which can be printed (Step S23 or S27). Since print operation is stopped when one side of an article of consumption also runs short from a part for printing schedule number of sheets, this makes a direction with few residues the number of sheets which can be printed.
[0037] Furthermore, a system controller 10 compares the printing number of sheets (P) reserved as the set-up number of sheets (PA and PA are RR or PR) which can be printed (Step S24). Though natural, a system controller 10 by a comparison result when there is more number of sheets (PA) which can be printed the set-up printing number of sheets -- (-- since

the printing job only for P) is possible, the already computed printing office important point time is displayed on the predetermined region 42A on a display 42 (NO of Step S24, S26).
[0038] the printing number of sheets to which the system controller 10 was set by the comparison result on the other hand when there was less number of sheets (PA) which can be printed -- (-- since the printing job only for P) is impossible, an alarm display is performed (YES of Step S24, S25). Moreover, since print operation may be stopped by generating (for example, two-sheet delivery of a form etc.) of a trouble when same and a margin does not have the number of sheets (PA) which can be printed, and the set-up printing number of sheets (P) in either a form or an ink ribbon, an alarm display is performed. As an example of an alarm display, as shown, for example in drawing 5 (A), the mark which shows an ink ribbon, and its residue (RR = five sheets) are displayed on the predetermined region 42B on a display 42. Moreover, as shown, for example in this figure (B), the mark which shows a form, and its residue (PR = five sheets) are displayed on the predetermined region 42B on a display 42.
[0039] In addition, it may display the contents of warning shown in drawing 5 (A) or (B) on another predetermined region 42B while displaying printing residual time on the predetermined region 42A of a display 42, as the above-mentioned warning process is performed, for example, it is shown [a system controller 10] in drawing 4 also in execution of print operation.
[0040] As mentioned above, as reservation processing before performing print operation of the selected picture, by setting up printing specifications, such as printing number of sheets, printing office important point time is computed and, according to this embodiment, it displays on the display screen of a display. Therefore, a user can check time until a desired printing job is completed in advance, before starting print operation.
[0041] Furthermore, it can be judged whether the print operation for the printing number of sheets which converted into printing number of sheets the residue in this time of the form which is the article of consumption of a printer, and an ink ribbon, detected it, and set it up is possible. In this case, that is displayed when either forms or ink ribbons run short to the desired printing job for printing number of sheets. Therefore, the user can supply the form or ink ribbon which runs short before the start of print operation. Moreover, although it does not run short, when either a form or an ink ribbon exists only necessary minimum, that is similarly displayed as a warning. Therefore, the user can supply a form or an ink ribbon, in order to secure a margin.
[0042] in addition, by this embodiment, a system controller 10 explains the case where the computed "printing office important point time" is displayed as it is -- it does not restrict to this That is, you may compute and display the time which print operation ends at present from the computed printing office important point time on the assumption that print operation is started.
[0043] Furthermore, as shown in drawing 4 , this embodiment explained the case where "residual time of printing" was displayed on the predetermined viewing area 42A, during

execution of print operation, but it does not restrict to this. That is, although the remaining number of sheets of printing number of sheets (P) is counted for every end of a printing job (see Step 6 of drawing 8), you may display this counted value instead of "residual time of printing."

[0044]

[Effect of the Invention] As explained in full detail above, when printing a picture especially on two or more sheets of forms in the printer which prints the picture photoed, for example with the digital camera etc. according to this invention, printing end time (time) can be checked beforehand [of print operation]. Therefore, a user becomes possible [canceling the inconvenience of the useless latency time occurring]. Moreover, the state [exhausting] of the article of consumption of printers, such as a form and an ink ribbon, can be checked beforehand [of print operation]. Therefore, it becomes possible to fully supply beforehand and generating of a stop state of the print operation by an article of consumption can be prevented beforehand.

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the important section of the printer related to the embodiment of this invention.

[Drawing 2] The figure for explaining the system which connected the printer body related to this embodiment, and the television receiver.

[Drawing 3] The conceptual diagram showing an example of the display screen related to the print operation of this embodiment.

[Drawing 4] The conceptual diagram showing an example of the display screen related to the print operation of this embodiment.

[Drawing 5] The conceptual diagram showing an example of the display screen related to the print operation of this embodiment.

[Drawing 6] The figure for explaining the residue detection system of the ink ribbon related to this embodiment.

[Drawing 7] The figure for explaining the residue detection system of the form related to this embodiment.

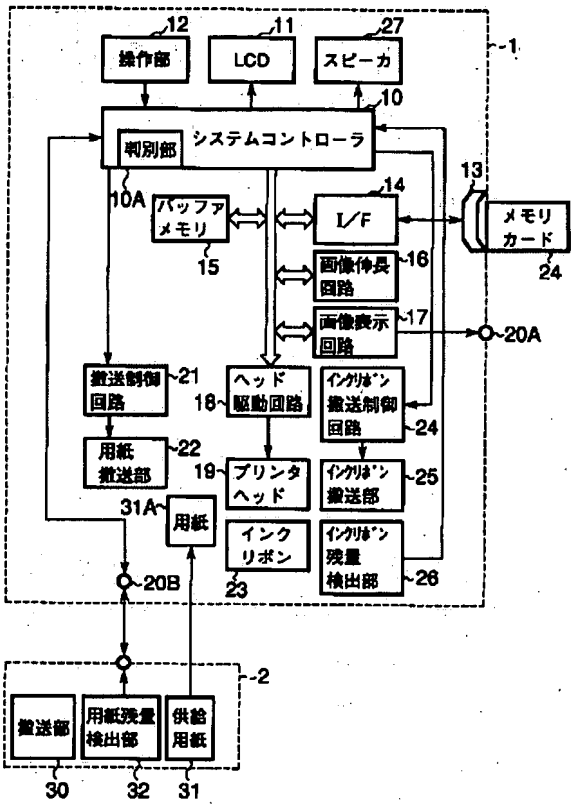
[Drawing 8] The flow chart for explaining the procedure of print operation related to this embodiment.

[Drawing 9] The flow chart for explaining the procedure of display processing of printing office important point time, and a warning process in the print operation related to this embodiment.

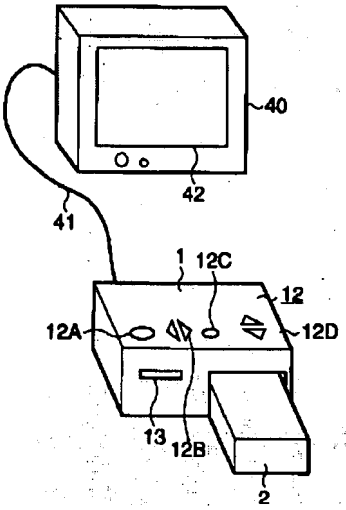
[Explanations of letters or numerals]

1 -- Printer body
2 -- Form feeder
10 -- System controller
11 -- Liquid crystal display (LCD)
12 -- Control unit
13 -- Card slot
14 -- Interface
15 -- Buffer memory
16 -- Picture expansion circuit
17 -- Image display circuit
18 -- Head drive circuit
19 -- Printer head
20A -- Output terminal
20B -- Input/output terminal
21 -- Conveyance control circuit
22 -- Form conveyance section
23 -- Ink ribbon
24 -- Memory card
25 -- Ink ribbon conveyance section
26 -- Ink ribbon residue detecting element
30 -- Conveyance section
32 -- Form residue detecting element

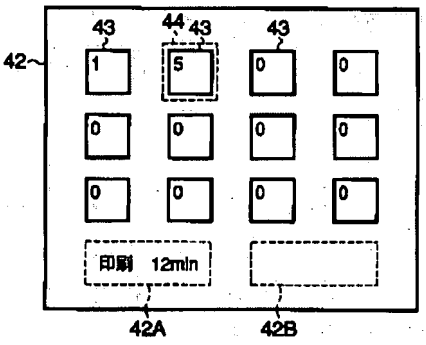
[Drawing 1]



[Drawing 2]



[Drawing 3]



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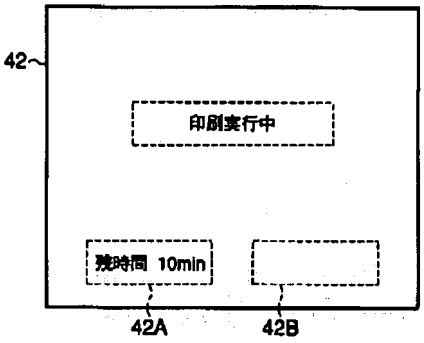

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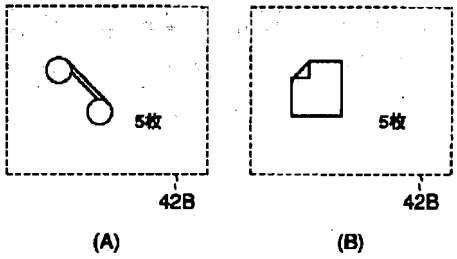

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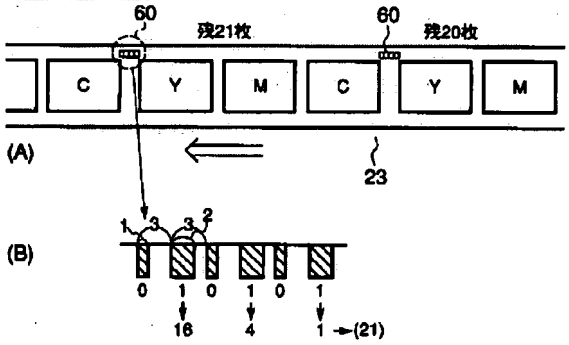
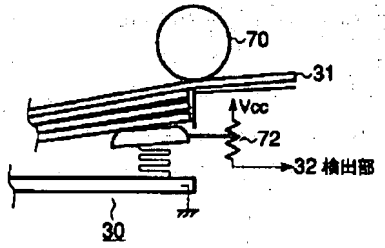
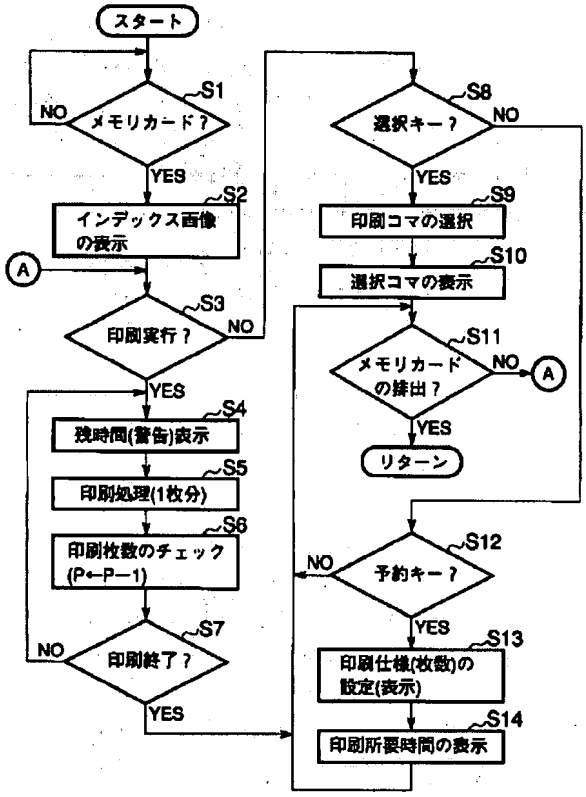


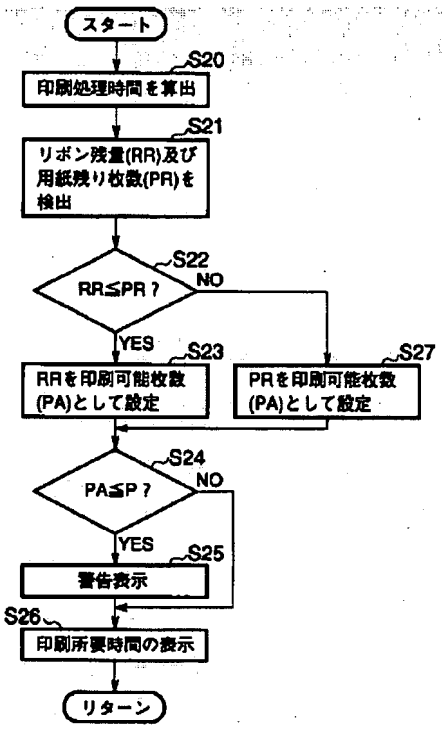
[Drawing 7]



[Drawing 8]



[Drawing 9]



[Translation done.]